ANALYTIC SUBJECT INDEX TO VOLUME 3

In this subject-index the titles of articles are disregarded, the entries being based on analyses of the contents of the original articles. Entries marked (D) refer to digests which appear under "Digest of Periodical Literature" in the journal; entries marked (R) refer to reviews which appear under "Brief Notices of Recent Publications" and "Teaching Aids."

Advanced physics (see Intermediate and advanced physics)

American Association of Physics Teachers
- Committee personnels: recognition of outstanding teaching and contributions to teaching—45; secondary education—45
- Committee reports: electric and magnetic units and dimensions—90; membership—44; physics in a liberal arts education—91; tests—91, 145
- Manual of demonstration experiments, R. M. Sutton—85, 181
- Pittsburgh meeting, Dec. 27–29, 1934, annual business meeting—45; executive committee meetings—44; papers read—44
- Regional chapter at Chicago—44
- St. Louis meeting, 1935, announcements—128
- Treasurer's report, P. E. Klopsteg—45

Apparatus (see General physics laboratory, Intermediate and advanced physics laboratory, Lecture-demonstrations, Shop practice and apparatus; Visual materials, and methods)

Appointment services and professional opportunities
- Appointment service for unemployed physicists—129, 199
- Geophysics in oil industry, vocational aspects, L. L. Nettleton—110
- Graduate appointments available in physics, for 1935–36—42, 58; for 1936–37—194
- Mathematics, employment situation in, E. J. Moulton—199 (D)
- Positions wanted by A. A. P. T. members—129, 199

Atomic physics (see General physics, Intermediate and advanced physics)

Biography (see History and biography)

Book reviews (see Reviews of books, pamphlets and trade literature)

Charts (see Visual materials and methods)

Committees, A. A. P. T. (see American Association of Physics Teachers)

Courses (see Differentiated first year courses, Engineering physics General physics, Intermediate and advanced physics, Premedical physics)

Demonstrations (see Lecture-demonstrations)

Differentiated first year courses (see also Engineering physics, Premedical physics)
- Differentiation based on student ability and needs, A. A. P. T. tests committee—145
- Literature: for agricultural students—48 (R); for home economics students—92 (R)
- Non-science majors, special courses for, C. N. Warfield—91

Education, general
- Grades, method for reducing to common standard, N. F. Beardsley—137
- Secondary schools, major tendencies in, C. C. Henson—47 (D)

Education, physics and science (see also Education, general, General physics, Secondary school physics, Teacher training, Tests)
- Attitudes, possibility of teaching, A. Lichenstein—93 (R)
- College entrance examinations in science, proposed revisions in College Entrance Examination Board—126
- Liberal arts education, physics in, A. A. P. T. committee—91
- Mental discipline *vs.* fact learning, A. S. Adams—61
- Non-science majors taking college physics, C. N. Warfield—91
- Objectives of science teaching, J. Dewey—47 (D); A. S. Adams—61; necessity for and methods of defining in terms of student ability and needs, A. A. P. T. tests committee—145; S. R. Powers—191
- Physics Club of Philadelphia, H. C. Richards—70
- Professional goals of students as related to achievement in physics, A. A. P. T. tests committee—145
- Research for undergraduates, S. R. Williams—7
- Scientific thinking, a main objective, J. Dewey—47 (D)
- Student interest and training, obtaining both simultaneously, A. S. Adams—61
- Student originality in laboratory, M. H. Trytten—192
- Study habits, methods for improving, W. J. Jackson—59
- Survey courses, statistics on, types, objectives, advantages, etc., R. J. Havighurst—97; S. R. Powers—191
- Teaching, recognition of, outstanding contributions to, A. A. P. T. committee on—45, 189
- Trends in engineering education, W. N. Jones—47 (D)

Electricity and Magnetism (see General physics, Intermediate and advanced physics, Lecture-demonstrations, Terminology and notation, Textbooks, Units, dimensions and measurements)

Engineering physics (see also General physics)
- Electric insulation, importance of problem, need for help from physics, Anon.—47 (D)
- Literature: textbooks—92 (R)
- S. P. E. E. physics section, 1935 program, G. E. Grantham—90
- Trends in engineering education, W. N. Jones—47 (D)

Examinations (see Tests)

Experiments (see General physics, Intermediate and advanced physics, Lecture-demonstrations)

First year college physics (see General physics)

General physics, educational aspects (see also Education, physics and science, General physics laboratory, educational aspects, Secondary school physics, Tests)
- Fine arts, more emphasis on physics of, R. D. Rusk—167
- Gifted and weak students, early identification of, A. A. P. T. tests committee—145
- Non-science majors taking physics, C. N. Warfield—91
- Objectives, in terms of student ability and needs, A. A. P. T. tests committee—145; scientific thinking an objective, J. Dewey—47 (D); study habits an objective, W. J. Jackson—59
- Optics, teaching of, Committee of the Physical Society—140 (R)
- Prerequisites, performances of students having various, A. A. P.T. tests committee—145
- Student interest and training, realizing both objectives, A. S. Adams—61

General physics, subject matter and references for (see also General physics laboratory, Intermediate and advanced physics, Lecture-demonstrations, Philosophy of science, Reviews of books, pamphlets and trade literature, Social and economic aspects of science, Textbooks, errors and inadequate treatments in, Terminology and notation, Visual materials and methods)
- Acoustical tones, beat and combinational, H. Hazel—95 (D); physical and psychological characteristics of, H. Fletcher—94 (D)
- Advanced study and research, facilities of various graduate departments—42, 58, 194
- Biophysics, mathematical approach to, N. Rashevsky—141 (D)

General physics, subject matter and references for (continued)
Communication, functional operations in, J. Mills—94 (D)
Electric dynamo and motor rule, A. T. Jones—86; H. Crew—138
Electric insulation, importance of research on, Anon.—47 (D)
Electric and magnetic units and dimensions in elementary instruction, L. Page, N. I. Adams, Jr.—51; A. A. P. T. committee report—90; R. T. Birge—102, 171
Electric units, how to remember conversion factors, M. S. Allen—41
Electromagnetic induction, misconceptions regarding, L. Page N. I. Adams, Jr.—51
Electrostatic force law, limitations of, L. Page, N. I. Adams, Jr.—51; problem illustrating, E. U. Condon—85
Eutectic ice, Anon.—46 (D)
Fine arts and physics, R. D. Rusk—167; physical investigation of paintings, P. D. R.—141 (D)
Gases, specific heats of, W. L. Cheney—138
Geophysical prospecting for oil, survey, L. L. Nettleton—110
Gravity geophysical prospecting, L. L. Nettleton—110
Heat engine, reversible, in elementary texts, W. R. Wright—63
Heats, specific, of gases, W. L. Cheney—138
Ice, 6 forms of, transitions, F. L. Verwiebe—179
Impact, elastic, when $m_1/m_2 = 3$, H. B. Lemon—36
Kirchhoff's laws, general method, application, R. A. Sawyer—86
Light, elliptical polarization by total reflection, amounts, signs and reasons for phase changes, W. W. Sleator—1
Literature, textbooks and references—38 (R), 48 (R), 92 (R), 122 (R), 139 (R), 140 (R), 196 (R)
Magnetic geophysical prospecting, L. L. Nettleton—110
Magnetostatic force law, limitations of, L. Page, N. I. Adams, Jr.—51
Mass and force units, teaching of English absolute and gravitational, G. E. Owen—39; W. W. Sleator—193
Mercury poisoning, danger of, W. G. Leighton, P. A. Leighton—94 (D)
Momentum, conservation in impacts, H. B. Lemon—36
Nuclear disintegration, artificial, survey, G. P. Harnwell—10
Optics, sign conventions, advantages of ray treatment, etc. Committee of the Physical Society—140 (R)
Problems and catch questions, on barometer, Coulomb force laws, temperature radiations, E. U. Condon—85; on mechanics, W. W. Sleator—138
Radium poisoning, survey, R. D. Evans—198 (D)
Seismic geophysical prospecting, L. L. Nettleton—110
Standards, classes of primary, R. T. Birge—102; of volumetric glassware, Anon.—47 (D)
Structure and continuity of solids and liquids, J. Frenkel—198 (D)
Telephotography, principles and equipment, J. Mills—94 (D)
Thermodynamic surfaces, P–V–T curves and models for H_2O and CO_2, F. L. Verwiebe—179; continuity of solid and liquid states, J. Frenkel—198 (D)
Universal constants, nature of, R. T. Birge—171
Waves, standing, by reflection, W. H. Pielemeier—89

General physics laboratory, apparatus and experiments (see also Intermediate and advanced physics laboratory, Lecture-demonstrations, Shop practice and apparatus)
Acceleration, linear, angular, s. h. m., and various kinetics experiments, by U-tube manometers, R. M. Sutton—77
Alternating-current generator and motor, 3-phase, G. M. Evans—76
Automobile, acceleration of, R. M. Sutton—77; working exhibit of, E. Hutchisson, V. Hicks—65
Ballistic pendulum and safety device, for speed of rifle bullets, J. H. McLeod—37
Cathetometer and attachments, C. J. Overbeck—34
Centrifugal force, by U-tube manometer, R. M. Sutton—77
Dynamics of translation and rotation, efficiency, etc., apparatus and experiments, W. Soller—133
Elastic spring, study of, C. J. Overbeck—34
Electrostatic pendulum, for timing, operating relays, etc., J. A. Van den Akker—72
Elevator, acceleration of, R. M. Sutton—77
Galvanometer, avoiding eye fatigue with, R. V. Jones—46 (D); brackets for storing D'Arsonval wall type, I. A. Balinkin—132
Heat conductivity of poor conductors, A. L. Fitch—135
Induction coil, thyraton substitute for vibrator, L. C. Verman—141 (D)
Jolly balance, rapid-reading type, C. J. Overbeck—34
Joule's equivalent, electrical method, J. H. McLeod—183
Key, charge-discharge, with timer, W. H. Eller—188
Laboratory rooms, at Univ. of Cincinnati, L. M. Alexander—123; at Washington Univ., C. F. Hagenow—25
Momentum, conservation of, and speed of rifle bullets, J. H. McLeod—37
Optics, recommended experiments, Committee of the Physical Society—140 (R); working exhibit of lenses and mirrors, E. Hutchisson, V. Hicks—65
Oscillator, small, for general purposes, G. P. Harnwell—185
Physical properties of an element, list of experiments on, G. B. Welch—69
Sound waves and laws of strings, working exhibit, E. Hutchisson, V. Hicks—65
Spectrometer, device for focusing telescope, A. H. Weber—130
Surface tension, direct method, C. J. Overbeck—34
Tangents to curves, device for constructing, R. M. Hoffman—46 (D)
Torque, direction of moment arms, M. H. Trytten—46 (D)

General physic laboratory, educational aspects
Objectives, A. S. Adams—61
Organization of course about a central theme, G. B. Welch—69
Single-period laboratory, advantages, H. C. Krenerick—144 (D)
Student originality, method for encouraging, F. R. Pratt—189
Study habits, laboratory can improve, W. J. Jackson—59

Heat (see General physics, History and biography, Intermediate and advanced physics, Lecture-demonstrations, Terminology and notation, Textbooks, Visual materials and methods)

History and biography
Curie, Madame Pierre, biographical note, A. F. Kovarik—96 (D)
Davy, Humphrey, unimportance of experiments on frictional development of heat, E. N. da C. Andrade—141 (D)
Difference tones, discovery, A. T. Jones—49
Literature, reference books—139 (R)
Physics Club of Philadelphia, H. C. Richards—70
Röntgen, Wilhelm, anecdotal biography, J. P. Donaghey—142 (D)
Rumford, Count, life and works, M. S. Powell—161
Smith, Professor K. K., biographical sketch, H. Crew—182
Units and dimensions, R. T. Birge—102, 171

Intermediate and advanced physics, subject matter (see also General physics, Intermediate and advanced physics laboratory, philosophy of science, Textbooks, Terminology and notation)
Electric and magnetic units and dimensions, A. A. P. T. committee report—90; methods of establishing, arbitrary nature, R. T. Birge—102, 171
Electromagnetic induction, misconceptions regarding, L. Page, N. I. Adams, Jr.—51
Electrostatic force law, limitations of, L. Page, N. I. Adams, Jr.—51; illustrative problem, E. U. Condon—85
Gases, conditions for degeneracy, M. Masius—40
Geophysical prospecting for oil, survey, L. L. Nettleton—110
Graduate appointments and facilities for advanced study in various physics departments—42, 58, 194
Light, amounts, signs and reasons for phase changes in elliptical polarization by total reflection; W. W. Sleator—1; Fresnel interference, demonstration, C. E. Miller—75; teaching of advanced optics, Committee of the Physical Society—140 (R)
Literature, intermediate and advanced text- and reference books: 92 (R), 93 (R), 139 (R), 140 (R), 196 (R)
Magnetostatics force law, limitations of, L. Page, N. I. Adams, Jr.—51
Nuclear disintegration, artificial, survey, G. P. Harnwell—10
Problems and catch questions, on barometer, Coulomb force laws, temperature radiation, E. U. Condon—85; on mechanics, W. W. Sleator—138
Publication of scientific works, age-proof paper for, S. T. Farquhar

—47 (D); proposed reforms in methods, A. Seidell, J. B. Ficklen, M. B. Visscher—48 (D)
Research, facilities in various physics departments, 42, 58, 194; undergraduate, S. R. Williams—7
Solids and liquids, structure of, J. Frenkel—198 (D)
Thermodynamic surfaces, P–V–T curves and models for H_2O and CO_2, F. L. Verwiebe—179; continuity of solid and liquid states, J. Frenkel—198 (D)
Tones, discovery of difference, A. T. Jones—49; distinction between beat and combinational, H. Hazel—95 (D); physical and psychological characteristics, H. Fletcher—94 (D)
Waves, standing, by reflection, W. H. Pielenfeier—89
Young's modulus, temperature variation, J. E. Calthrop, J. T. Miller—131

Intermediate and advanced physics laboratory (see also General physics laboratory, Lecture-demonstrations, Shop practice and apparatus)
Balmer series of H and D, simple discharge tube and oscillator, G. P. Harnwell—185
Electric current, absolute measurement, J. E. Calthrop—32
Electric resistance. key and timer for rate-of-leakage method, W. H. Eller—188
Electrometer tube circuit, student form, G. P. Harnwell—82
Electrostatic pendulum, for timing, operating relays, etc., J. A. Van den Akker—72
Galvanometer, avoiding eye fatigue with, R. V. Jones—46 (D); brackets for storing D'Arsonval wall type, I. A. Balinkin—132
Heat conductivity of poor conductors, A. L. Fitch—135
Induction coil, thyraton substitute for vibrator, L. C. Verman—141 (D)
Joule's equivalent, electrical method, J. H. McLeod—183
Literature: laboratory manuals,—139 (R), 196 (R)
Optics, recommended experiments, Committee of the Physical Society—140 (R)
Oscillator, small, for general purposes, G. P. Harnwell—185
Research rooms, at Univ. of Cincinnati, L. M. Alexander—123; at Washington Univ., C. F. Hagenow—25
Research for undergraduates, S. R. Williams—7
Rydberg constants and masses of H and D, G. P. Harnwell—185
Wind tunnel, construction and use of student, S. R. Williams—7
Young's modulus, temperature variations, J. E. Calthrop, J. T. Miller—131

Laboratory manuals (see Reviews of books, pamphlets, and trade literature)

Laboratory, student (see General physics laboratory, Intermediate and advanced physics laboratory, Shop practice and apparatus)

Lecture-demonstrations (see also Visual materials and methods)
Acceleration, linear, angular, s.h.m., by U-tube manometer with recording attachment, R. M. Sutton—77
Alternating current, shown by neon glow lamp, P. E. Wilson—46 (D); oscillograph, H. Lloyd—141 (D); simultaneous projection of current and voltage waves, I. B. Davidson—46 (D); 3-phase motor and generator attachment, G. M. Evans—76
Centrifugal force, by U-tube manometer, R. M. Sutton—77
Color mixing, lantern slide, J. J. Heilemann—184
Electric circuit, effect of shunt, A. T. Jones—138; water analogy, F. R. Pratt—189
Electroscope, projecting, H. E. Hammond—39; W. J. Jackson—193
Electrostatic pendulum, J. A. Van den Akker—72
Evaporation of mercury, W. G. Leighton, P. A. Leighton—94 (D)
Impact, elastic, when $m_1/m_2=3$, H. B. Lemon—36
Induction coil, thyraton substitute for vibrator, L. C. Verman—141 (D)
Lecture rooms, at University of Cincinnati, L. M. Alexander—123; at Washington University, C. F. Hagenow—25
Literature: A. A. P. T. manual, R. M. Sutton—85, 189
Momentum, conservation in impact, H. B. Lemon—36
Optical filters, transmission characteristics, J. J. Heilemann—184
Optical interference patterns, C. E. Miller—75
Oscillograph, for projecting 2 wave forms simultaneously, I. B. Davidson—46 (D); for projecting transients, characteristic curves, etc., H. Lloyd—141 (D)
Radio tube, control action of grid, A. J. O'Leary—134
Thermal expansion of rubber, negative, A. Longacre, A. S. Graham—197 (D)
Thermodynamic surfaces, models for H_2O and CO_2, F. L. Verwiebe—179
Vernier scale, lantern slide, J. J. Heilemann—72

Light and radiation (see General physics, History and biography, Intermediate and advanced physics, Lecture-demonstrations, Terminology and notation, Textbooks, Visual materials and methods)

Mechanics (see General physics, History and biography, Intermediate and advanced physics, Lecture-demonstrations, Terminology and notation, Textbooks, Units, dimensions and measurements, Visual materials and methods)

Museums, physics and science (see Visual materials and methods)

Philosophy of science and scientific methodology
Biology, mathematical, and the mechanism-vitalism issue, N. Rashevsky—141 (D)
Literature: Architecture of the Universe, W. F. G. Swann—93 (R)

Premedical physics (see also General physics)
A. A. M. C. symposium on premedical preparation—129
Biophysics, mathematical approach to, N. Rashevsky—141 (D)
Literature: Eastman publications—196 (R)
Radium poisoning, survey, R. D. Evans—198 (D)

Proceedings of the American Association of Physics Teachers (see American Association of Physics Teachers)

Reviews of books, pamphlets and trade literature
American Chemical Society, The Pronunciation of Chemical Words—196
Bausch and Lomb, The Educational Focus—196
Black, N. Henry, An Introductory Course in College Physics—139
Central Scientific Co., Cenco News Chats—196
Committee of the Physical Society, Report on the Teaching of Geometrical Optics—140
Cornell Extension Bulletins—48
Crisler, V. L., A Discussion of some of the Principles of Acoustical Insulation—196
Crowther, James Arnold, Ions, Electrons, and Ionizing Radiations—92
Davey, Wheeler P., A Study of Crystal Structure and Its Applications—93
Eastman Kodak Co., Publications—196
Eldridge, John A., Introduction to Atomic Physics, Lecture Assignments and Notes—196; The Physical Basis of Things—92
Fisher Scientific Co., The Laboratory—196
Frank, Nathaniel H., Introduction to Mechanics and Heat—92
General Electric Co., Library Service—196; Student Manuals on Electronics—196
General Motors Co., When the Wheels Revolve—196
Guest, Paul G., Static Electricity in Nature and Industry—196
Henney, Keith, Principles of Radio—38
Higbie, H. H., Lighting Calculations—93
Houston, William V., Principles of Mathematical Physics—93
Humphreys, W. J., Weather Proverbs and Paradoxes—139
Jean, Frank Covert, Ezra Clarence Harrah and Fred Louis Herman, Man and the Nature of His Physical Universe—38
Jones, Franklin T., Physics Problems and Questions—196
Joos, Georg, Theoretical Physics—140
Knowlton, A. A., Physics for College Students—139
Lemon, Harvey B., From Galileo to Cosmic Rays—92
Lewis, S. Judd, Spectroscopy in Science and Industry—38
Lichtenstein, Arthur, Can Attitudes Be Taught?—93
Martin, Thomas, Faraday—139
Mason, Frances (ed.), The Great Design—93

Reviews of books, pamphlets and trade literature (continued)
McCorkle, Paul, and J. Arthur Lewis, College Physical Science—92
Meyer, Charles F., The Diffraction of Light, X-Rays and Material Particles—93
Mills, John, Signals and Speech in Electrical Communication—38
Mine Safety Appliance Co., Carbon Monoxide the Killer—196
Mott-Smith, Morton, The Story of Energy—38
Osborn, Frederick A., Physics of the Home—92
Patterson, Austin M, A German-English Dictionary for Chemists—140
Randall, J. T., The Diffraction of X-Rays and Electrons by Amorphous Solids, Liquids and Gases—93
Richardson, E. G., Sound—139
Richardson, Harlow C., Luther N. Becklund, Ledru O. Guthrie and Clifford I. Haga, Practical Forms in Exposition—38
Roberts, Michael and E. R. Thomas, Newton and the Origin of Colours—A Study of One of the Earliest Examples of Scientific Method—139
Searle, G. F. C., Experimental Physics—139
Shaw, Sir Napier, The Drama of the Weather—38
Stetson, Harlan True, Earth, Radio and the Stars—93
Swann, W. F. G., The Architecture of the Universe—93
Univ. of Chicago Press, Lantern Slides of Astronomical Negative—48
White, Harvey Elliott, Introduction to Atomic Spectra—140
Whitehead, T. N., The Design and Use of Instruments and Accurate Mechanism—93
Zeleny, Anthony, Elements of Electricity—139

Scientific Method (see Philosophy of science)

Secondary school physics (see also Education, physics and other sciences)
A. A. P. T. committee personnel—45
College performance of students who have had secondary school physics, A. A. P. T. tests committee—145
Laboratory, experiments for able students, A. Longacre, A. S. Graham—197 (D); single-period, H. C. Krenerick—144 (D)
Light, teaching of, Committee of the Physical Society—140 (R)
Survey courses in physical science, C. A. S. T. disapproval of, Anon.—96 (D); study of, R. J. Havighurst—97; S. R. Powers—191
Teaching loads, Anon.—96 (D)
Trends, College Entrance Examination Board—126; due to poor economic conditions, F. D. Curtis—47 (D)

Shop practice and apparatus (see also General physics laboratory, Intermediate and advanced physics laboratory)
Filtration of small quantities of viscous liquids, E. B. Moss—46 (D)
Literature: instrument design—93 (R)

Social and economic aspects of science
Economic conditions, effect on science teaching, F. D. Curtis—47 (D)
Employment situation in mathematics, E. J. Moulton—199 (D)
Geophysics in oil industry, economic importance, L. L. Nettleton—110
Literature: The Great Design, Frances Mason (ed.)—93 (R)

Sound (see General physics, History and Biography, Intermediate and advanced physics, Lecture-demonstrations, Terminology and notation, Textbooks, Visual material and methods)

Survey courses in science (see Education, physics and science)

Teacher training
Courses on teaching of science, number available, H. Breckbill—144 (D)
Outstanding teaching and contributions to teaching, A. A. P. T. committee on recognition of—45, 189

Terminology and notation
Acceleration of gravity, J. D. Akerman—39
Beat notes and differential tones, distinction, H. Hazel—95 (D)
Color terminology, faulty, R. D. Rusk—167
Constant of magnetostatics, R. T. Birge—171
Current, misuse of term, H. Howe—88
Dielectric constants, absolute and relative, R. T. Birge—171
Electric units: gauss, oersted, weber, pramaxwell, A. E. Kennelly—90; names of absolute, M. S. Allen—41
Geometrical optics, faulty terms in, Committee of the Physical Society—140 (R)
Geophysical terms: "gravity," etc., L. L. Nettleton—110
Literature: pronunciation of chemical words—196 (R)
Motional electromotive force, L. Page, N. I. Adams, Jr.—51
Powers of ten, rules for expressing, W. H. Michener—90
Radio terms: modulation, etc. H. Hazel—95 (D)
Survey course classifications, R. J. Havighurst—97; S. R. Powers—191

Tests
A. A. P. T. college physics testing program, plans of test committee—91; comprehensive report for 1934–35—145
College entrance examinations in science, proposed revision of, College Entrance Examination Board—126
Grades, method for reducing to common standard, N. F. Beardsley—137
Pre-study tests, function, A. A. P. T. tests committee—145
Study habits, use of tests in developing, W. J. Jackson—59

Textbooks, errors and inadequate treatments in (see also Reviews of books, pamphlets and trade literature)
Errors: characteristics of tones, H. Fletcher—94 (D); color theory, R. D. Rusk—167; Davy's experiments on heat by friction, E. N. da C. Andrade—141 (D); definitions of pound weight, horsepower, pressure, G. E. Owen—39; discovery of difference tones, A. T. Jones—49; distinction between beat and differential tones, faulty radio terms, H. Hazel—95 (D); meaning of physical equations, R. T. Birge—102; misuse of term *current*, H. Howe—88
Inadequate treatments: arbitrary character of derived units, nature of universal constants, R. T. Birge—102; centrifugal and inertial forces, C. F. Hagenow—190; Coulomb force laws and law of induced e.m.f., L. Page, N. I. Adams, Jr.—51; Kirchhoff's laws, R. A. Sawyer—86; music and color theory, R. D. Rusk—167; photometry, image formation, etc., Committee of the Physical Society—140 (R); reversible heat engines, W. R. Wright—63; specific heats of gases, W. L. Cheney—138; standing waves by reflection, W. H. Pielemeier—89

Units, dimensions and measurements
Electric and magnetic units and dimensions, L. Page, N. I. Adams, Jr.—51; A. A. P. T. committee—90; R. T. Birge—102, 171
English absolute and gravitational units, best system for elementary instruction, G. E. Owen—39; W. W. Sleator—193
Fundamental and derived units, dimensions, general principles for establishing, R. T. Birge—102, 171
I. E. C. actions, criticism of action on dimensions and nature of *B* and *H*, R. T. Birge—171; modifications of c.g.s. magnetic formulas, etc., A. E. Kennelly—89
Standards, classes of primary, R. T. Birge—102; of volumetric glassware, Anon.—47 (D)

Visual materials and methods (see also Lecture-demonstrations)
Charts: diagrams of 4-cycle engine, spectrometers, etc.—48 (R)
Lantern equipment: filing cards for lantern slides, C. J. Koenig—46 (D); in Washington Univ. lecture rooms, C. F. Hagenow—25
Lantern slide subjects: astronomical slides, catalog—48 (R); color mixer, J. J. Heilemann—184; optical interference patterns, C. E. Miller—75; vernier scale, J. J. Heilemann—72
Museum and exhibit pieces: electrostatic pendulum, J. A. Van den Akker—72; models of thermodynamic surfaces, F. L. Verwiebe—179; cabinets on sound waves, laws of strings, optical lenses and mirrors, and automobile, E. Hutchisson, V. Hicks—65
Portraits: Langmuir, Coolidge, Edison, Thomson, Steinmetz, W. R. Whitney—48 (D)